

Abstract Submitted
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Charge transfer effect of FeSe thin films on SrTiO₃¹ YUANJUN ZHOU, ANDREW MILLIS, Columbia University — Monolayer FeSe grown on SrTiO₃ substrate has shown a significant enhancement in the superconducting transition temperature (T_c) relative to the bulk material. Monolayers of FeSe are electron doped relative to bulk; we propose that the doping comes from work-function-mismatch driven charge transfer from SrTiO₃ impurity bands, modified by out-of-plane polar distortions of the SrTiO₃. We present a modified Schottky model combined with density functional calculations substantiating this picture for monolayer FeSe films on Nb doped SrTiO₃. Physically relevant levels of Nb doping are shown to lead to doping of the FeSe compatible with observation. Adding polar fluctuations to the model leads to an electron-phonon interaction whose effect on the transition temperature is investigated.

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